2nd & Part Bill Reserved quantities

Quality Control Report For

Coarse and Fine Aggregate, Cement , Kerb Stones, GSB, BM, BC

2nd

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 **Date:03.01.2018**

TEST REPORT

Client Name & address* : Executive Engineer,
Byatarayanapura Division, BBMP.

Name of Work* : Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

Name of the test : Sieve Analysis

Method of test : IS : 2386 Part 1 -1963 RA-2011

Type of Aggregate : Coarse Aggregates (20mm down size)

Date of Testing : 02.01.2018

Total Wt. of Aggregates taken in gms= **10000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA-2011)
40	0	0	0	100	100
20	485	4.85	4.85	95.15	95-100
10	5895	58.95	63.80	36.20	25-55
4.75	3495	34.95	98.75	1.25	0-10

* Information is furnished by the Customer/Representative

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3. Any Query regarding the report must be reported within 15 days from the date of testing.

RBI -Technical Services
(CONSULTANT)

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

for RBI-TECHNICAL SERVICES

Proprietor

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

RBI - Technical Services

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 **Date:03.01.2018**

TEST REPORT

Client Name & address* : Executive Engineer, Byatarayanapura Division, BBMP.

Name of Work* : Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

Name of the test : Sieve Analysis

Method of test : IS : 2386 Part 1 -1963 RA-2011

Type of Aggregate : Fine Aggregates (Sand)

Date of Testing : 02.01.2018

Total Wt. of Aggregates taken in gms= 500

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA-2011) For Zone-II
10	0	0	0	100	100
4.75	22.5	4.50	4.50	95.5	90-100
2.36	55.6	11.12	15.62	84.4	75-100
1.18	123.2	24.64	40.26	59.7	55-90
0.6	82.5	16.50	56.76	43.2	35-59
0.3	100.2	20.04	76.80	23.2	8-30
0.15	88.9	17.78	94.58	5.4	0-20

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RBI -Technical Services
(CONSULTANT)

NDR DR(Tech)

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

For RBI-TECHNICAL SERVICES

Proprietor

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Cell : 9448352709 Email : rbitc2@gmail.com

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 **Date:05.01.2018**

TEST REPORT

Client Name & address* : Executive Engineer,
Byatarayanapura Division, BBMP.

Name of Work* : Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

Method of test : IS-4031 (Part -5), (Part - 4), (Part - 6) 1988 (RA-2009)

Type of Sample : Cement, OPC 43 grade

Date of Testing : 02.01.2018 to 05.01.2018

PHYSICAL PROPERTIES

Sl.No	Name of the test	Test Results	Requirements as per IS: 8112-1989
1	Consistancy	31.00%	Not Mentioned
2	Initial Setting Time	140 minutes	Not Less than 30 Minutes
3	Final Setting Time	380 minutes	Not More than 600 Minutes
4	Compressive Strength		
	3 Days (72 hrs)	25.0 Mpa	Shall not be less than 23.0 Mpa

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RBI -Technical Services
(CONSULTANT)

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division.
Yelahanka Zone, B.B.M.P.
Bangalore.

for RBI-TECHNICAL SERVICES

Proprietor

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP/2017-18

Date: 12.01.2018

CC KERB STONE (CORE) TEST REPORT

Name of Client : **Executive Engineer,**
Byatarayanapura Division, BBMP.

Name of work : Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

No.of Sample Tested : 03

Date of Testing : **11.01.2018**

Techinical Reference : IS:516-1959 (Reaffirmed 2008), SP-24:1983.

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	75.00	100.00	0.835	1890.05	1.33	0.960	56.50	12.79	13.81	13.26	16.57
2	75.00	105.00	0.845	1821.61	1.40	0.960	59.50	13.47	14.55	13.96	17.45
3	75.00	110.00	0.890	1831.41	1.47	0.960	58.50	13.24	14.30	13.73	17.16

Information is furnished by the Agency

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RBI -Technical Services (CONSULTANT)

Assistant Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P
Bangalore.

For RBI-TECHNICAL SERVICES

Proprietor

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP/2017-18

Date: 12.01.2018

CC KERB STONE (CORE) TEST REPORT

Name of Client : **Executive Engineer, Byatarayanapura Division, BBMP.**

Name of work : Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

No.of Sample Tested : 03

Date of Testing : **11.01.2018**

Techinical Reference : IS:516-1959 (Reaffirmed 2008), SP-24:1983.

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	75.00	105.00	0.805	1735.38	1.40	0.960	61.20	13.85	14.96	14.36	17.95
2	75.00	100.00	0.795	1799.51	1.33	0.960	60.20	13.63	14.72	14.13	17.66
3	75.00	105.00	0.815	1756.94	1.40	0.960	61.70	13.97	15.08	14.48	18.10

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RBI -Technical Services (CONSULTANT)

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division.
Yelahanka Zone, B.B.M.P
Bangalore.

For RBI-TECHNICAL SERVICES

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

Cell : 9448352709 Email : rbitc2@gmail.com

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ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP/2017-18 Date: 12.01.2018

CC KERB STONE (CORE) TEST REPORT

Name of Client : **Executive Engineer, Byatarayanapura Division, BBMP.**

Name of work : Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

No.of Sample Tested : 03

Date of Testing : **11.01.2018**

Techinical Reference : IS:516-1959 (Reaffirmed 2008), SP-24:1983.

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	75.00	105.00	0.795	1713.82	1.40	0.960	58.00	13.13	14.18	13.61	17.01
2	75.00	105.00	0.805	1735.38	1.40	0.960	57.00	12.90	13.93	13.38	16.72
3	75.00	110.00	0.826	1699.71	1.47	0.960	56.50	12.79	13.81	13.26	16.57

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RBI -Technical Services (CONSULTANT)

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P
Bangalore.

For RBI-TECHNICAL SERVICES

Proprietor

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/017 Date:07.02.2018

RBI- Technical Services

GRADATION FOR GSB
MORTH TABLE-400-11

Name of the Work Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.

Client Executive Engineer,
Byatarayanapura Division, BBMP.

Source of Sample On site

Date of Testing 06.02.2018

Material Close - Graded Granular Sub-Base, Grading II

Oven dry Wt.(gms) **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	MORTH Specifications Table 400-1.
53	0	0	0	100	100
26.5	450	4.5	4.5	95.75	70-100
9.5	3150	3154.5	31.5	68.5	50-80
4.75	2050	5204.5	52.0	48.0	40-65
2.36	1285	6489.5	64.9	35.1	30-50
0.425	1295	7784.5	77.8	22.2	15-25
0.075	1505	9289.5	92.9	7.1	3-10

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

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RBI - Technical Services
(CONSULTANT)

RBI TECHNICAL SERVICES
Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division.
Yelahanka Zone, B.B.M.P
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

RBI - Technical Services

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/017 Date:08.02.2018

RBI- Technical Services

ATTERBERG LIMITS TEST FOR GSB
MORTH TABLE-400-13

Client	:	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of Work	:	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
Source of Sample	:	Onsite
Date of Sample Testing	:	**06.02.2018 to 07.02.2018**
Material	:	**Close - Graded Granular Sub-Base, Grading II**

Sl. No.	Name of Test	Test Method	Test Results
1	Liquid Limit	IS : 2720-1985 Part 5 RA : 2010	22.50%
3	Plasticity index	IS : 2720-1985 Part 5 RA : 2010	NP

Remarks:

1 Results relate only to the sample (s) under test in as received condition and applicable parameter (s).

2 The sample will be stored upto one month from the date of issue of test report unless otherwise specified.

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(CONSULTANT)

for RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer.
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P..
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001

Date:26.02.2018

Aggregate Shape Test

IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
Type of Mix	**Bituminous Macadam**
Source of Sample	Hot Mix Plant
Date of Testing	**25.02.2018**

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	0	13.5	w_5	0	40.5	x_5	0
20	16	W_6	2450	10.8	w_6	170	32.4	x_6	155
16	12.5	W_7	1650	8.55	w_7	150	25.5	x_7	125
12.5	10	W_8	950	6.75	w_8	100	20.2	x_8	130
10	6.3	W_9	125	4.89	w_9	10	14.7	x_9	5

Flakiness Index 8.31%

Elongation Index 8.02%

Combined Flakiness & Elongation Index 16.33%

Comments:

→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Macadam is 30%

RBI-TECHNICAL SERVICES
RBI -Technical Services
(CONSULTANT)
Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:26.02.2018

RBI- Technical Services

Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	**Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.**
Type of Mix	**Bituminous Macadam**
Source of Sample	Hot Mix Plant
Date of Testing	**25.02.2018**

Total Weight of Sample: **5000**

SIEVE SIZE, mm	Weight Retained, gm	Cummulative Weight retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
26.5	0	0	0	100	100	Bituminous Macadam Grade-II specification as per MORTH
19	485	9.70	9.70	90.30	90 - 100	
13.2	1650	33.00	42.70	57.30	56 - 88	
4.75	1265	25.30	68.00	32.00	16 - 36	
2.36	755	15.10	83.10	16.90	4-19	
0.3	535	10.70	93.80	6.20	2-10	
0.075	250	5.00	98.80	1.20	0-8	

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

for RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
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ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:26.02.2018

RBI- Technical Services

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
Type of Mix	**Bituminous Macadam**
Source of Sample	Hot Mix Plant
Date of Testing	**25.02.2018**

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	384	383	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	85.6	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297.5	296.9	
4	Aggregate Impact value = percent fines			
	100* (W_2/W_1) percent	22.29	22.45	
				22.37

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
BCOLESHNAL

For RBI TECHNICAL SERVICES

Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engine.
Kodigehalli Sub Division.
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

Cell : 9448352709 Email : rbitc2@gmail.com

2nd part

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Macadam
DATE OF TESTING	22.02.2018

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	483	484
Difference in weight after extraction (W3) gms= (W1-W2)	17.00	16.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	3.40	3.20
5. Average in %	**3.30**	

For RBI - Technical Services

Engineer

NDD
AE(T)

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Macadam
DATE OF TESTING	22.02.2018

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	482	484
Difference in weight after extraction (W3) gms= (W1-W2)	18.00	16.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	3.60	3.20
5. Average in %	**3.40**	

For RBI - Technical Services

Engineer

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Macadam
DATE OF TESTING	22.02.2018

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	482	484
Difference in weight after extraction (W3) gms= (W1-W2)	18.00	16.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	3.60	3.20
5. Average in %	**3.40**	

For RBI - Technical Services

Aeenash.D
Engineer

NDP
AE(W2)

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Macadam
DATE OF TESTING	22.02.2018

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	482	484
Difference in weight after extraction (W3) gms= (W1-W2)	18.00	16.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	3.60	3.20
5. Average in %	**3.40**	

For RBI - Technical Services

Engineer

AMD
AE(T-2)

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:05.03.2018

RBI- Technical Services

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**04.03.2018**

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	381	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	83.6	84.9	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	296	
4	Aggregate Impact value = percent fines			
	100* (W_2/W_1) percent	21.94	22.28	
				22.11

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES

Assistant Engineer

Assistant Executive Engineer
Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E, K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:04.03.2018

RBI- Technical Services

Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**03.03.2018**

Total Weight of Sample: **5000** gms

SIEVE SIZE, mm	Weight Retained, gm	Cummulative Weight retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grading-II specification as per MORTH
13.2	380	7.60	7.60	92.40	79 - 100	
9.5	565	11.30	18.90	81.10	70 - 88	
4.75	825	16.50	35.40	64.60	53 - 71	
2.36	635	12.70	48.10	51.90	42 - 58	
1.18	525	10.50	58.60	41.40	34 - 48	
0.600	343	6.86	65.46	34.54	26 - 38	
0.300	574	11.48	76.94	23.06	18 - 28	
0.150	461	9.22	86.16	13.84	12 - 20	
0.075	398	7.96	94.12	5.88	4 - 10	

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
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RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P
Bangalore.

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ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 **Date: 05.03.2018**

TEST REPORT

Client	:	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
Name of the work	:	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
Source of Sample	:	Hot Mix plant
Date of Testing	:	04.03.2018

The results of the tests conducted on the **CRMB 55** sample using for Bituminous Concrete collected from the contractor's plant are as follows:

Sl.No	Description	Test Result	Requirement as per IS:15462:2004 for CRMB 55
1	Penetration at 25^{0}c, 1/10 mm,100g.5s	50	< 60
2	Softening point, ^{0}c	57	Min. 55
3	Flash Point, ^{0}c	235	Min. 220

⇒ *The results indicated above are based on the tests carried out on the samples received in the laboratory.*

⇒ *Any Query regarding the report must be reported immediately.*

for RBI-TECHNICAL SERVICES

Proprietor

RBI -Technical Services

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

Cell : 9448352709 Email : rbitc2@gmail.com

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003

Date:04.03.2018

Aggregate Shape Test

IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Formation and Asphalting to main road of Veerannana palya from Railway level Crossing upto outer ring road in ward no.07, Bytarayanapura.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**03.03.2018**

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	0	13.5	w_5	0	40.5	x_5	0
20	16	W_6	1990	10.8	w_6	197	32.4	x_6	187
16	12.5	W_7	1505	8.55	w_7	135	25.5	x_7	157
12.5	10	W_8	995	6.75	w_8	184	20.2	x_8	100
10	6.3	W_9	215	4.89	w_9	18	14.7	x_9	27

Flakiness Index 11.35%

Elongation Index 10.01%

Combined Flakiness & Elongation Index 21.36%

Comments:

→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Concrete is 30%

RBI-Technical Services
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RBI - TECHNICAL SERVICES
Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director : P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003 Date:08.03.2018

RBI- Technical Services

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Formation and Asphalting to main road of Veerannana palya from Railway level Crossing upto outer ring road in ward no.07, Bytarayanapura.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**05.03.2018 to 08.03.2018**

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2420	2420	2410	
2	Weight of basket suspended in water	W_2 g	1220	1220	1220	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1200	1200	1190	
4	Weight of saturated surface dry aggregate in air	W_3 g	2010	2012	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	810	812	830	
6	Weight of oven dried aggregate	W_4 g	2005	2007	2014	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.48	2.47	2.43	2.451
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.491	2.487	2.444	2.467
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.2%	0.25%	0.30%	0.27%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)
for RBI-TECHNICAL SERVICES
Proprietor

Assistant Engineer

Assistant Executive Engineer
Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
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2nd part

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**08.05.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	469.5	469
Difference in weight after extraction (W3) gms= (W1-W2)	30.50	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.10	6.20
5. Average in %	**6.15**	

For RBI - Technical Services

Aashish D
Engineer

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**01.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.5	469
Difference in weight after extraction (W3) gms= (W1-W2)	29.50	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	6.20
5. Average in %	**6.05**	

For RBI - Technical Services

Engineer

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**01.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470	469
Difference in weight after extraction (W3) gms= (W1-W2)	30.00	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.00	6.20
5. Average in %	**6.10**	

For RBI - Technical Services

Aadinath .D
Engineer

AE(WE)

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**01.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470	469
Difference in weight after extraction (W3) gms= (W1-W2)	30.00	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.00	6.20
5. Average in %	**6.10**	

For RBI - Technical Service

Aashish.D

NDP

DE(Tech)

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**02.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470	470
Difference in weight after extraction (W3) gms= (W1-W2)	30.00	30.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.00	6.00
5. Average in %	**6.00**	

For RDL Technical Services

Authorised Signatory

NOD
AE(W)

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**02.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	471	469
Difference in weight after extraction (W3) gms= (W1-W2)	29.00	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.80	6.20
5. Average in %	**6.00**	

For RBI - Technical Services

Site En

NDP
AE(W7)

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**02.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.5	469
Difference in weight after extraction (W3) gms= (W1-W2)	29.50	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	6.20
5. Average in %	**6.05**	

For RBI - Technical Services

Site Engineer

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to Roads, Drains and Drilling Borwells in ward no. 07 & 08 of Kodigehalli Sub-Division of Byatarayanapura Division, under P3106 Nagarathana works.
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	Bituminous Concrete
DATE OF TESTING	**02.03.2018**

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470	469
Difference in weight after extraction (W3) gms= (W1-W2)	30.00	31.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.00	6.20
5. Average in %	**6.10**	

For RBI - Technical Services

Site Engineer